ROS at CS 3 and Beyond

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The Bad Old Days

robotics *only* for graduate students

all purpose-built

- hardware
- OS
- API
- (no) infrastructure

The Good New Days

ROS!

- free, open-source, downloadable
- all of robotics

Turtlebots

- cheap, “reliable”

Kinect

- just plain awesome

It Just Works!

(for some suitable definition of Just Works)

Why is ROS Good?

all of robotics is there

- so you don't have to write example code

there's an active community interested in it

- you can steal Zach's assignments

you can teach more than robotics

- source control, software engineering, collaboration, open-source models, etc.

Why is ROS Good?

accessible to non CS majors

- building blocks and “scripting”
- important for grad classes

context for sub-problems in robotics

- students see where all of the bits fit together

easy bridge to Masters and Ph.D. problems

- they're already using research code

Why is ROS Good?

extensive hardware support

- robots, sensors

extensive simulator support

- your students can program NASA's Robonaut

what you did today was half of a whole semester just a few years ago

- Zach's week 4 assignment is a single line of python on a Turtlebot

Why is ROS Bad?

unit step learning curve

- especially for undergrad and non-CS majors
- it's really big and scary (even for me)
- it's hard to find things with the current tools

linux! command line! multiple terminals!

- multi-process, distributed, asynchronous, scary, scary, scary

Why is ROS Bad?

all of robotics is there

- beware of lazy instructors
- Zach's week 4 assignment is a single line of python on a Turtlebot

no book aimed at the university market

- yet

no cohesive community of ROS educators

- yet

Onward to Grad School!

undergrads are already working with research code and advanced concepts

- the localization stack would have got you a Ph.D. five years ago

there are a number of platforms that are cheap and “just work”

- code on your Create runs on my PR2, and on NASA's Robonaut

Building a Portfolio

grad school applications (and job interviews)

- point at the code you've published
- more than “I wrote a linked list”

becoming part of the community

- finding peers and peer mentors
- figuring out what research looks like